

Chapter

**6**

# **DEVELOPMENT ALTERNATIVES**



## DEVELOPMENT ALTERNATIVES

*for the Airport Master Plan for  
Whiteriver Airport*

### 6.0 INTRODUCTION

The preceding discussion of facility needs provides the basis for developing alternative expansion concepts. The Facility Requirements Chapter provided recommended development for the majority of needs for the existing and future airport for the Whiteriver Area. This Chapter will focus on the logical alternatives that the Airport Planning Committee and the White Mountain Apache Tribe should consider for the existing and future aviation needs of the region. As discussed in Chapter V, "Facility Requirements", the existing runway length at Whiteriver is adequate, however Runway 1/19 and the parallel taxiway are in poor condition and in need of major rehabilitation. The parallel taxiway also does not meet separation standards to the runway and penetrations exist in the Taxiway Object Free Area (TOFA). This feasibility study has identified six general alternatives, including the "Do nothing" alternative, which could provide adequate aviation facilities in the area. Figures depicting the alternatives presented in Alternatives "2, 3, and 4" are located at the end of this chapter. The alternatives include:

- 1) Maintain the airport as it presently exists. ("Do nothing" alternative)
- 2) Rehabilitate and strengthen Runway 1/19 and the parallel taxiway (obtain a modification to standards for the runway/taxiway separation).
- 3) Rehabilitate and strengthen Runway 1/19. Relocate the parallel taxiway 40 feet to the northwest.
- 4) Relocate Runway 1/19 by 40 feet to the southeast. Rehabilitate and strengthen the parallel taxiway.
- 5) Develop a new airport site.
- 6) Provide service from another airport in the region.

The following narrative concentrates on the development of facilities needed to meet the existing and future demand from general aviation aircraft. Associated preliminary cost estimates for each alternative have also been provided as part of this Chapter. Alternatives 2, 3, and 4 all include the extension of the safety area

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for Runway 1, a parallel taxiway extension to full length, rehabilitation and strengthening of the apron, replacement/installation of runway and taxiway lighting, installation of visual aids including PAPIs and REILs, installation of an AWOS, construction of helipads, and an apron expansion. Land acquisition costs have not been included. Since the airport is located on the White Mountain Apache Reservation, land acquisition costs are not applicable. Additionally, this section has not included the usual maintenance cost associated with maintaining the existing or future facility.

## **6.1 ALTERNATIVE "1"**

### **Maintain the airport as it presently exists. ("Do nothing" alternative.)**

The airport is unique for the area in that it serves as a Bureau of Indian Affairs Air Tanker Base, as well as providing a facility for air medivac flights and access to the region for business, recreational, and tourism flights. These aircraft operations occur on a regular and consistent basis and are projected to continue for the foreseeable future. The existing runway and taxiway are in poor condition and in need of major rehabilitation. With this alternative the pavements would continue to deteriorate and eventually become unusable. This alternative will not accomplish the community's desire to attract and accommodate the design aircraft fleet in an effort to provide an adequate facility for basing air tankers and attracting economic development and business opportunities to the community and the entire region. Also important to the continued growth of the area are the recreational and tourism interests and the need to provide a facility to serve those needs.

The major advantages to this alternative are:

- Minimizes the amount of funding by the White Mountain Apache Tribe for the airport, since no major capital improvement projects would occur.
- Eliminates the potential environmental impacts associated with airport development.

The major disadvantages to this alternative are:

- Since pavements may not be maintained appropriately, it may increase the liability to the White Mountain Apache Tribe as a result of a stronger potential for mishaps occurring at the airport.
- Does nothing to reduce nonstandard conditions presently found at the airport, which include insufficient runway to taxiway centerline separation, objects within the TOFA, and insufficient Safety Areas.
- Significantly reduces the ability of the Whiteriver Airport to meet the present and future demand by the aviation users of the region.

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## 6.2 ALTERNATIVE "2"

**Rehabilitate and strengthen Runway 1/19 and the parallel taxiway (obtain a modification to standards for the runway/taxiway separation).**

This alternative would rehabilitate and strengthen the existing airfield pavements, including the runway, taxiways, and apron. A modification to standards would be required for the insufficient runway/taxiway separation. The existing separation is 200 feet. The FAA design standard for B-II aircraft is 240 feet. The modification to standards may be justified by interpolating the maximum wingspan and approach speed which at 200 feet separation provides the same level of safety as a category B-II aircraft with maximum wingspan and approach speed (79 feet and 121 knots respectively) at 240 feet separation. Based on this interpolation, the design aircraft with 200 feet runway/taxiway separation could not exceed a wingspan of 65.8 feet and an approach speed of 100.8 knots. Local procedures would then need to be established to ensure that no aircraft are on the parallel taxiway or runway when aircraft with greater wingspans or approach speeds than those listed above are using the runway or taxiway. While these procedures could be managed by the operations tower controller or broadcast over an Automatic Terminal Information Service (ATIS), it may be difficult to enforce, especially when the operations tower is closed.

The major advantages to this alternative are:

- Reduces the total capital funding required by the White Mountain Apache Tribe for capital improvements.
- Provides improved airfield pavements suitable for aircraft operations.

The major disadvantages to this alternative are:

- Limits the design aircraft to a smaller percentage of the critical aircraft fleet.
- Requires special procedures to be implemented to accommodate some aircraft in the design fleet and may reduce airport safety due to more complex airport and aircraft operating restrictions.
- Does not eliminate objects within the Taxiway Object Free Area.

## 6.3 ALTERNATIVE "3"

**Rehabilitate and strengthen Runway 1/19. Relocate parallel taxiway 40 feet to the northwest.**

This alternative would rehabilitate and strengthen the existing runway and apron pavements. The parallel taxiway would be relocated and constructed 40 feet to the northwest. The operations tower, slurry tanks, and fence would be relocated and the air tanker loading pit widened. This alternative would meet the FAA standard for runway/taxiway separation and eliminate objects within the TOFA.

The major advantages for this alternative are:

- Provides a runway which meets FAA criteria and would be a cost effective alternative to completing a major relocation of the existing runway.

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- Provides improved airfield pavements suitable for aircraft operations.
  - Eliminates deficiencies in FAA safety and design standards.

The major disadvantages to this alternative are:

- Requires a higher capital expense by the White Mountain Apache Tribe than Alternative 2.
- Requires relocating the operations tower and slurry tanks.

## **6.4 ALTERNATIVE "4"**

**Relocate Runway 1/19 by 40 feet to the southeast. Rehabilitate and strengthen parallel taxiway.**

This alternative would involve the relocation and construction of Runway 1/19 by 40 feet to the southeast and the rehabilitation and strengthening of the parallel taxiway. Due to the proximity of the White River, the ultimate runway length would be decreased by approximately 200 feet (100 feet on each runway end).

The major advantages to this alternative are:

- Provides a runway which meets FAA criteria.
- Corrects nonstandard conditions which occur with the existing runway.
- Provides improved airfield pavement suitable for aircraft operations.
- Does not require the relocation of any structures.

The major disadvantages to this alternative are:

- Ultimate runway length is decreased by approximately 200 feet.
- Requires a higher capital expense by the White Mountain Apache Tribe than Alternative 3.
- Does not eliminate objects within the Taxiway Object Free Area.

## **6.5 ALTERNATIVE "5"**

**Develop New Airport Site**

This alternative would allow the White Mountain Apache Tribe to consider the possible relocation of the Whiteriver Airport to a location which would meet FAA recommendations for aircraft having an ARC of B-II. The existing Whiteriver Airport would be closed if this alternative were chosen. A new airport would require the construction of needed infrastructure such as utility lines and access roads to the selected site. At the minimum, approximately 180 acres would need to be acquired to construct a runway/taxiway system which would have a length of approximately 6,300 feet, along with aircraft parking aprons, T-Hangar and conventional hangar development, and an FBO/Executive Terminal facility. While the acreage discussed is the minimum needed to construct a new airport, it does not include buffers to eliminate land use incompatibilities.

Normally the construction of a new runway is completed in a phased development, with the runway being constructed initially and the addition of a full length parallel

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taxiway at a later time. Existing airfield pavements at the Whiteriver Airport could be rotomilled and used as base course for the new airport. This would aid in reducing the loss of existing capital investment at the Whiteriver Airport.

The estimated costs for this alternative are based on a hypothetical site which meets grading criteria, crosswind coverage, proximity to the business district, environmental considerations, and FAR Part 77 criteria. A Site Selection Study of several potential sites would be required should this option be implemented.

The major advantages to this alternative are:

- There may be several areas on the White Mountain Apache Reservation which could provide an airport site which would allow *unencumbered* development to meet the recommendations as set forth by the FAA.
- Existing pavements at the Whiteriver Airport are in need of extensive rehabilitation and strengthening.
- A new site would provide a runway length that meets the minimum recommendations of 6,300 feet, and which could be extended to accommodate fully loaded large air tankers.

The major disadvantages to this alternative are:

- Approximately 250 acres of additional Reservation land would be converted to airport use.
- Possible prolonged negotiations for utility and access easements, land use conversion, and environmental studies.
- Positive economic impacts to the Whiteriver business district and Hon Dah Casino decrease as the distance to the new airport location increases. Currently, the airport is in very close proximity to the Whiteriver business district and Casino.
- The loss of the capital investment (if any) at the existing Whiteriver Airport.

## 6.6 ALTERNATIVE "6"

### **Provide service from another airport in the region.**

The Whiteriver Airport was constructed primarily to serve as an air tanker base for the Bureau of Indian Affairs Fire Management Department. It has also evolved to serve the general aviation interests and business aviation needs of Navajo County, the community of Whiteriver, the White Mountain Tribe and Reservation, and the surrounding region. The alternative of providing aviation services at another airport is considered impractical due to the lack of other airports close enough to Whiteriver which possess adequate facilities to meet the aviation demands of the area. The nearest airport providing facilities to accommodate the aircraft activity that takes place at the Whiteriver Airport is located at Show Low, 35 surface miles from Whiteriver. The closest air tanker base is located at Winslow, 163 surface miles from Whiteriver.

Providing service from another airport in the region would not be economical or feasible. Service from these locations would result in increased time, energy, and

additional travel expense to aviation users that would otherwise be unnecessary. This alternative ignores the existing problem of providing safe and efficient service to the aviation activity of the Whiteriver area.

## 6.7 ALTERNATIVE DEVELOPMENT ENGINEER'S COST ESTIMATES

The following tables outline the comparative costs for constructing each alternative concept. Cost estimates for Alternatives 1 and 6 have not been included since both alternatives would not require any additional capital outlay by the airport sponsor or the FAA. The FAA provides 91.06 percent funding for eligible airport development projects in Arizona. The State of Arizona currently does not participate in funding airport development projects on Indian Reservations. Legislation is being pursued to change this statute and allow for State participation in these projects. A more in-depth cost analysis of the "Preferred" alternative is included in the Capital Improvement Plan in Chapter IX.

**TABLE VI-1  
ALTERNATIVE "2"  
REHABILITATE EXISTING PAVEMENTS &  
OBTAIN MODIFICATION TO STANDARDS**

Description	Total	Estimated Cost	
		Federal Share	Local Share
1. Extend Safety Area Runway 1	\$225,000	\$204,885	\$20,115
2. Rehab & Strengthen Runway 1/19	\$1,400,000	\$1,274,840	\$125,160
3. Rehab & Strengthen Parking Apron	\$90,000	\$81,954	\$8,046
4. Rehab & Strengthen Taxiway	\$350,000	\$318,710	\$31,290
5. Construct Parallel Taxiway Extension	\$325,000	\$295,945	\$29,055
6. Replace/Install MIRLs & MITLs	\$200,000	\$182,120	\$17,880
7. Install PAPIs, REILs, and AWOS	\$160,000	\$145,696	\$14,304
8. Construct Helipads	\$330,000	\$300,498	\$29,502
9. Pave Access Road to Helipads	\$50,000	\$45,530	\$4,470
10. Extend Waterline to Helipad Area	\$100,000	\$91,060	\$8,940
11. Expand Aircraft Parking Apron	\$150,000	\$136,590	\$13,410
12. Update Airport Master Plan	\$50,000	\$45,530	\$4,470
<b>TOTAL</b>	<b>\$3,430,000</b>	<b>\$3,123,358</b>	<b>\$306,642</b>

**TABLE VI-2**  
**ALTERNATIVE "3"**  
**REHABILITATE RUNWAY 1/19 & RELOCATE TAXIWAY**

Description	Total	Estimated Cost	
		Federal Share	Local Share
1. Site Prep Relocated Taxiway	\$350,000	\$318,710	\$31,290
2. Extend Safety Area Runway 1	\$225,000	\$204,885	\$20,115
3. Relocate Operations Tower, Slurry Tanks, and Fence	\$50,000	\$45,530	\$4,470
4. Rehab & Strengthen Runway 1/19	\$1,400,000	\$1,274,840	\$125,160
5. Rehab & Strengthen Parking Apron	\$90,000	\$81,954	\$8,046
6. Construct Parallel Taxiway	\$775,000	\$705,715	\$69,285
7. Replace/Install MIRLs & MITLs	\$200,000	\$182,120	\$17,880
8. Install PAPIs , REILs, and AWOS	\$160,000	\$145,696	\$14,304
9. Construct Helipads	\$330,000	\$300,498	\$29,502
10. Pave Access Road to Helipads	\$50,000	\$45,530	\$4,470
11. Extend Waterline to Helipad Area	\$100,000	\$91,060	\$8,940
12. Expand Aircraft Parking Apron	\$150,000	\$136,590	\$13,410
13. Update Airport Master Plan	\$50,000	\$45,530	\$4,470
<b>TOTAL</b>	<b>\$3,930,000</b>	<b>\$3,578,658</b>	<b>\$351,342</b>

**TABLE VI-3**  
**ALTERNATIVE "4"**  
**RELOCATE RUNWAY 1/19 & REHABILITATE TAXIWAY**

Description	Total	Estimated Cost	
		Federal Share	Local Share
1. Site Prep Relocated Runway	\$650,000	\$591,890	\$58,110
2. Extend Safety Area Runway 1	\$225,000	\$204,885	\$20,115
4. Pave Relocated Runway	\$1,650,000	\$1,502,490	\$147,510
5. Rehab & Strengthen Parking Apron	\$90,000	\$81,954	\$8,046
6. Rehab & Strengthen Parallel Taxiway	\$350,000	\$318,710	\$31,290
7. Construct Parallel Taxiway Extension	\$325,000	\$295,945	\$29,055
8. Replace/Install MIRLs & MITLs	\$200,000	\$182,120	\$17,880
9. Install PAPIs , REILs, and AWOS	\$160,000	\$145,696	\$14,304
10. Construct Helipads	\$330,000	\$300,498	\$29,502
11. Pave Access Road to Helipads	\$50,000	\$45,530	\$4,470
12. Extend Waterline to Helipad Area	\$100,000	\$91,060	\$8,940
13. Expand Aircraft Parking Apron	\$150,000	\$136,590	\$13,410
14. Update Airport Master Plan	\$50,000	\$45,530	\$4,470
<b>TOTAL</b>	<b>\$4,330,000</b>	<b>\$3,942,898</b>	<b>\$387,102</b>

**TABLE VI-4  
ALTERNATIVE "5"  
DEVELOP NEW AIRPORT SITE**

Description	Total Cost	Estimated Cost	
		Federal Share	Local Share
1. Crack & Fog Seal Existing Airfield Pavements	\$75,000	\$68,295	\$6,705
2. Site Selection Study	50,000	45,530	4,470
3. EA for New Airport	50,000	45,530	4,470
4. Convert Approximately 250 Acres of Land to Airport Use	0	0	0
5. Construct Access Road	100,000	91,060	8,940
6. Site Prep for New Runway	1,190,000	1,083,614	106,386
7. Install Perimeter Fencing	85,000	77,401	7,599
8. Pave New Runway (100'x 6,500')	1,510,000	1,375,006	134,994
9. Construct Holding Bays @ Both Ends of New Runway	215,000	195,779	19,221
10. Construct Aircraft Parking Apron	300,000	273,180	26,820
11. Install Runway Lights & Signage	210,000	191,226	18,774
12. Install AWOS	100,000	91,060	8,940
13. Install PAPIs & REILs @ Both Ends of New Runway	100,000	91,060	8,940
14. Construct FBO/Hangar/Pilots Lounge*	100,000		
15. Construct 10 T-Hangars*	250,000		
16. Site Prep for Full-Length Parallel Taxiway	700,000	637,420	62,580
17. Pave New Parallel Taxiway	830,000	755,798	74,202
<b>TOTAL COSTS</b>	<b>\$5,865,000</b>	<b>\$5,340,669</b>	<b>\$524,331</b>

\* Typically, FBO facilities and hangars are financed by the FBO or privately with some form of agreement with the airport sponsor.

## 6.8 SUMMARY

The Whiteriver Airport is a general aviation facility serving as an Air Tanker Base for the Bureau of Indian Affairs Fire Management Department, as well as providing a facility for air medivac flights and access to the region for business, recreational, and tourism flights. The demands being placed on the airport are creating a need for safer and more efficient facilities for its users. The most pressing need for the airport is to rehabilitate and strengthen the airfield pavements and to meet FAA Safety and Design Standards. A runway/taxiway separation of 240 feet, and adequate safety and object free areas are required to meet FAA Safety and Design Standards.

The alternatives discussed in this chapter are listed below, depicted in the Figures located at the end of this Chapter, and summarized in Table VI-5 with respect to estimated cost, meeting FAA Standards, and other considerations.

## Development Alternatives for Whiteriver Airport:

- 1) Maintain the airport as it presently exists. ("Do nothing" alternative)
- 2) Rehabilitate and strengthen Runway 1/19 and the parallel taxiway (obtain a modification to standards for the runway/taxiway separation).
- 3) Rehabilitate and strengthen Runway 1/19. Relocate the parallel taxiway 40 feet to the northwest.
- 4) Relocate Runway 1/19 by 40 feet to the southeast. Rehabilitate and strengthen the parallel taxiway.
- 5) Develop a new airport site.
- 6) Provide service from another airport in the region.

**TABLE VI-5  
COMPARISON OF DEVELOPMENT ALTERNATIVES**

DEVELOPMENT ALTERNATIVES			
Alternative	Estimated Capital Cost	FAA Standards Met	Other Considerations & Impacts
Alternative "1"	\$0	N	Continued Operability of Airport Questionable
Alternative "2"	\$3,430,000	N <sup>1</sup>	Modification to Standards Required
Alternative "3"	\$3,930,000	Y	Move Ops Tower and Slurry Tanks
Alternative "4"	\$4,330,000	N <sup>1</sup>	Runway Length Decreased by 200 feet
Alternative "5"	\$5,865,000	Y	Limited Justification for Higher Cost
Alternative "6"	\$0	N/A	Unacceptable for Meeting Aviation Needs

N=No Y=Yes

<sup>1</sup> Objects within TOFA.

### 6.9.1 Selection of the Preferred Alternative

The preferred alternative selected for development of the Whiteriver Airport is **Alternative "3"**.

Alternative "1" does not provide for adequate pavement maintenance for the continued operation of the airport and was eliminated from further consideration. While Alternative "2" is feasible, the modification to standards would significantly limit the design aircraft. The existing design aircraft, the BAe Jetstream 31, with a wingspan of 52 feet and approach speed of 99 knots fits within the required safety level parameter of 65.8 feet and 100.8 knots; however, the future design aircraft, the Citation I S/P, with a wingspan of 47.1 feet and approach speed of 107 knots does not fall within the safety level parameters. Furthermore, the additional separation will be useful for the large air tanker aircraft which are expected to utilize the airport in the future. Alternative "4" meets runway/taxiway separation standards, but reduces the ultimate runway length by 200 feet

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and does not eliminate objects from within the TOFA. This alternative is also less cost effective than Alternative "3". There is limited justification for relocating the airport as described in Alternative "5". Despite occasional strong canyon crosswinds, the crosswind coverage of the existing airport is sufficient (see Section 2.9.3) and the existing runway length is sufficient for the forecasted aircraft and most potential commuter type commercial aircraft. Furthermore, relocating the airport would result in increased distance and travel time to transport air medivac patients from the Indian Health Service Clinic to the airport. Therefore, Alternative "5" was eliminated from further consideration. Alternative "6" was also eliminated from further consideration. This Alternative does not meet the goal of providing safe and efficient service to the aviation needs of the Whiteriver area, the Bureau of Indian Affairs, and the White Mountain Tribe and Reservation.

Alternative "3" provides an airport facility which meets FAA Standards, recommended runway length, and efficient service to the greater Whiteriver area. Although Alternative "3" requires a higher capital outlay than Alternative "2", it provides an increased level of safety with respect to runway/taxiway separation. Alternative "3" is more cost effective than Alternative "4" without reducing the ultimate runway length.

As a result of the analysis of the development alternatives, Alternative "3" was selected as the preferred alternative. An Environmental Overview has been accomplished for this alternative and is summarized in Chapter VIII. The requirement for an Environmental Assessment is not anticipated for the proposed development projects. A five-year Federal Capital Improvement Program (CIP) has been submitted to the FAA representing this alternative, and a 20 year CIP for this alternative, and related development, is included in Chapter IX of this report.

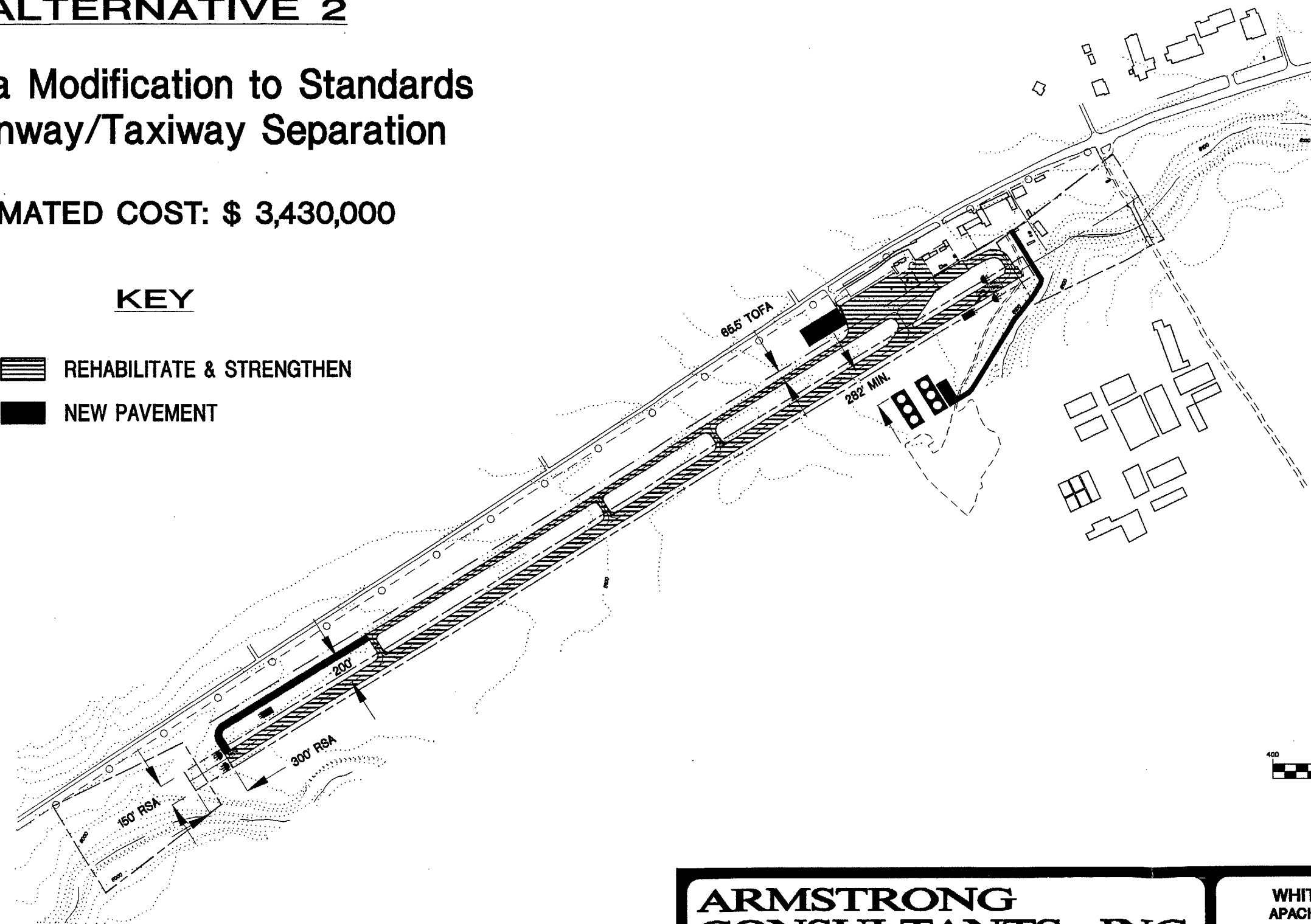
## ALTERNATIVE 2

### Obtain a Modification to Standards for Runway/Taxiway Separation

ESTIMATED COST: \$ 3,430,000

#### KEY

-  REHABILITATE & STRENGTHEN
-  NEW PAVEMENT



400 0 200 400 800  
SCALE IN FEET

NOTE: ALL COST ESTIMATES IN 1997 DOLLARS

**ARMSTRONG  
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AIRPORT DESIGN & PLANNING



861 Rood Avenue  
Grand Junction, CO 81501  
ph 970-242-0101 fax 970-241-1769

**WHITERIVER AIRPORT  
APACHE COUNTY, ARIZONA**

**DEVELOPMENT ALTERNATIVES**




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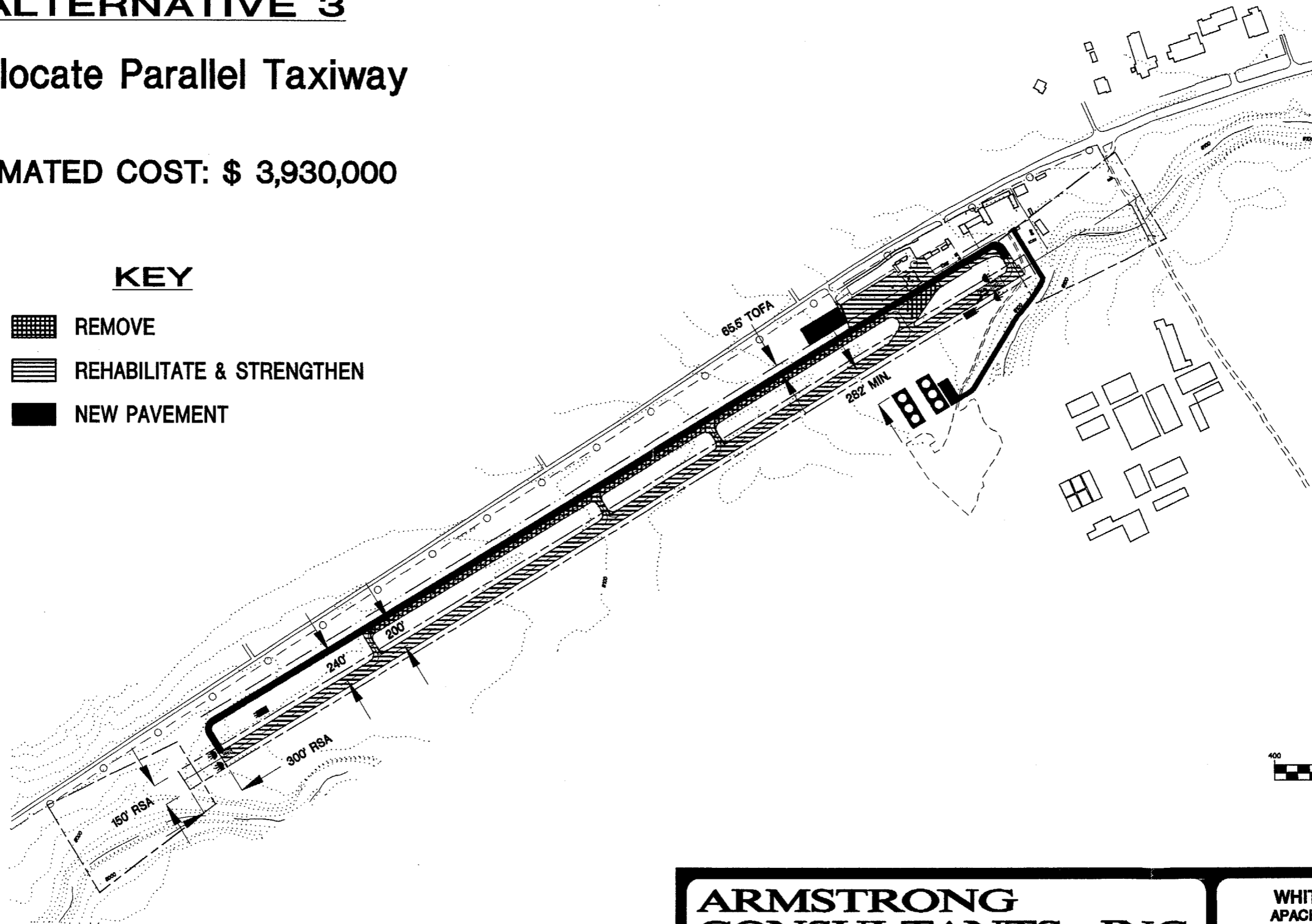
## ALTERNATIVE 3

### Relocate Parallel Taxiway

ESTIMATED COST: \$ 3,930,000

#### KEY

-  REMOVE
-  REHABILITATE & STRENGTHEN
-  NEW PAVEMENT



NOTE: ALL COST ESTIMATES IN 1997 DOLLARS

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**WHITERIVER AIRPORT  
APACHE COUNTY, ARIZONA**

#### DEVELOPMENT ALTERNATIVES




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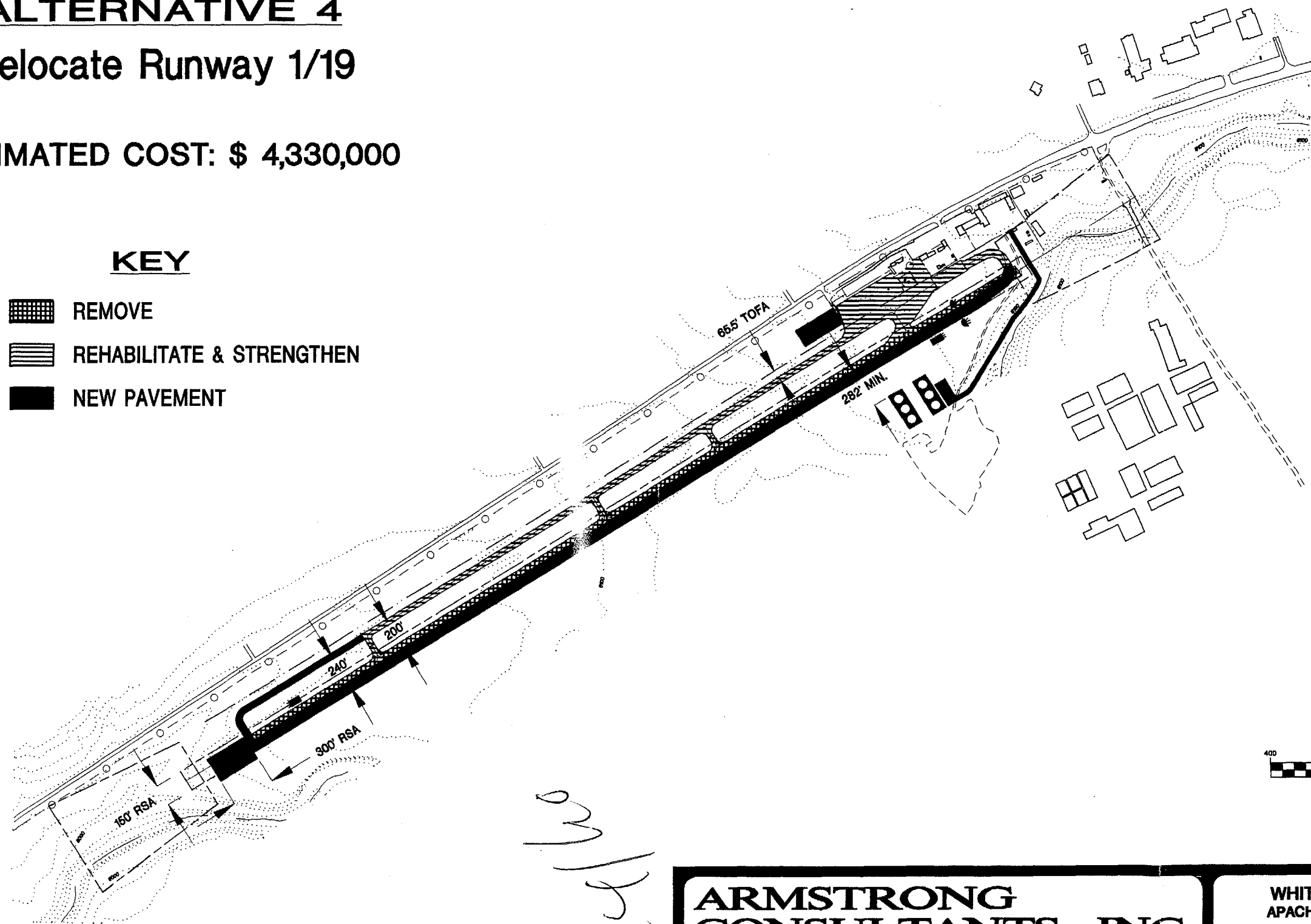
## ALTERNATIVE 4

### Relocate Runway 1/19

ESTIMATED COST: \$ 4,330,000

#### KEY

-  REMOVE
-  REHABILITATE & STRENGTHEN
-  NEW PAVEMENT



400 0 200 400 800  
SCALE IN FEET

NOTE: ALL COST ESTIMATES IN 1997 DOLLARS

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AIRPORT DESIGN & PLANNING

861 Rood Avenue  
Grand Junction, CO 81501  
ph 970-242-0101 fax 970-241-1769

**WHITERIVER AIRPORT**  
APACHE COUNTY, ARIZONA

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